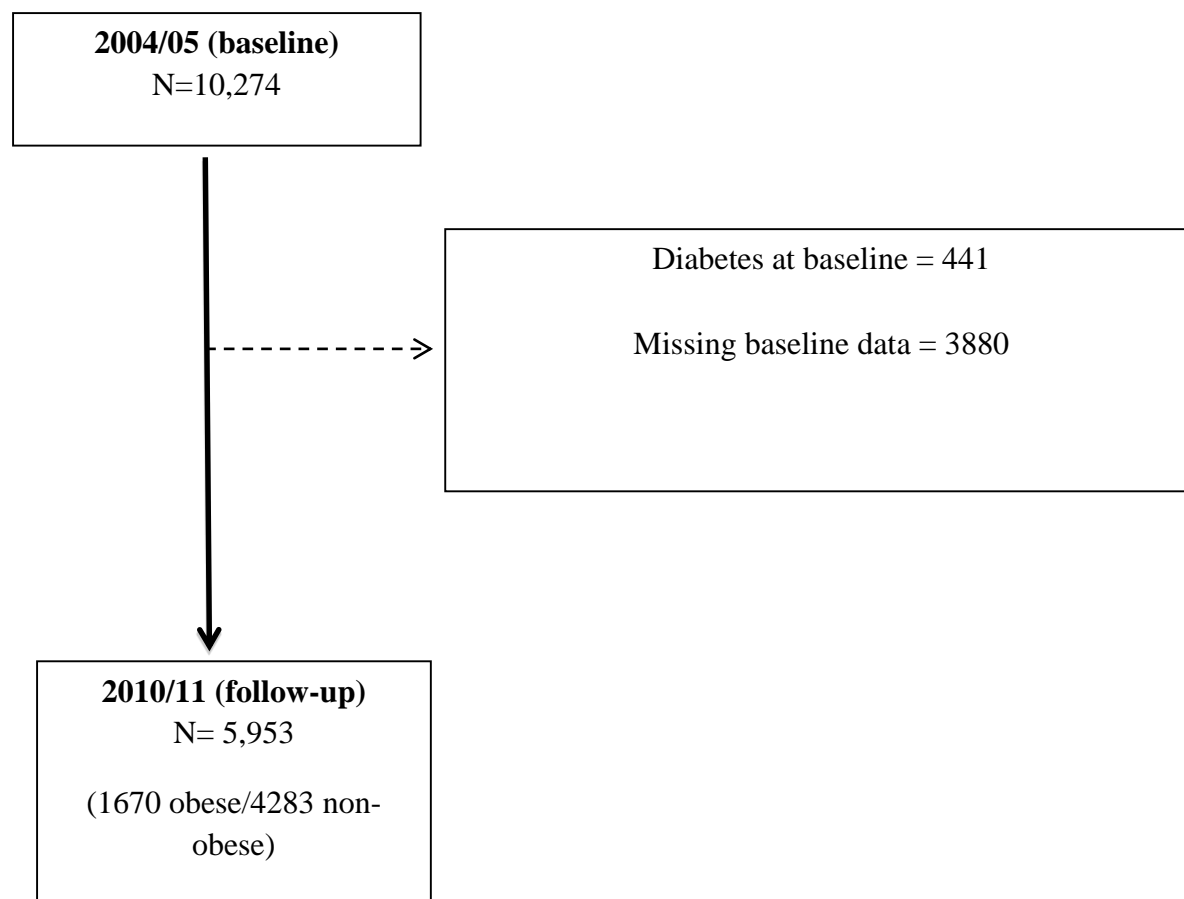


**Figure 1** Flow chart describing the selection of participants for the present study.



**Table 1** Demographic characteristics of the sample in relation to grip strength (n=5953)

Variables	Sex-specific handgrip strength tertile <sup>b</sup>				Sex-specific handgrip strength tertile <sup>b</sup>			
	Non-obese (n=4283)				Obese (n=1670)			
	High (n=1391)	Intermediate (n=1502)	Low (n=1390)	p value	High (n=603)	Intermediate (n=571)	Low (n=496)	
Age (y) <sup>a</sup>	58.3±6.1	63.0±8.3	69.6±9.8	<0.05	58.2±6.3	62.8±8.0	67.6±8.9	<0.05
Men (%)	38.0	49.8	50.9	<0.05	39.5	45.5	39.7	0.14
<i>Smoking</i>								
Current	17.8	16.3	16.1	0.44	14.2	15.0	11.3	<0.05
<i>Alcohol intake (%)</i>				<0.05				<0.05
Daily	28.8	27.2	24.3		19.7	19.4	12.9	
At least 1/wk (but not daily)	42.4	41.3	35.2		41.5	34.2	35.5	
Rarely	23.4	24.2	27.5		29.7	35.2	35.1	
Never	5.4	7.3	13.0		9.1	11.2	16.5	
<i>Physical activity (%)</i>								
Inactive	8.8	13.3	27.0	<0.05	16.6	23.8	38.1	<0.05

Moderate (at least 1/week)	48.5	51.4	52.2		55.6	51.5	43.8	
Vigorous (at least 1/week)	42.8	35.3	20.8		27.9	24.7	18.1	
<i>Depressive symptoms (%)</i>	9.3	10.9	16.3	<0.05	12.4	13.3	17.9	<0.05
<i>Prevalent CVD (%)</i>	11.3	12.9	15.8	<0.05	10.8	14.5	15.9	<0.05

<sup>a</sup>Data presented as mean± SD

<sup>b</sup> In men, the range of handgrip strength was 4 – 35.3, 35.4 – 44.2, >44.2 kg for bottom, intermediate and top tertile. The corresponding ranges in women were 4 – 19.6, 19.7 – 24.9, >24.9 kg , respectively.

**Table 2** Sarcopenic obesity and biomarkers.

Variable	Sex-specific handgrip strength tertile <sup>a</sup>				Sex-specific handgrip strength tertile <sup>a</sup>			
	Non-obese				Obese			
	High (n=1082)	Intermediate (n=1085)	Low (n=908)	p value	High (424)	Intermediate (n=380)	Low (n=307)	p value
Body mass index (kg/m <sup>2</sup> )	25.8±2.5	25.7±2.6	25.2±2.7	<0.001	33.9±3.8	33.4±3.6	33.6±3.3	0.38
Waist circumference (cm)	89.0±11.6	90.4±12.2	89.6±13.6	0.005	105.3±16.0	105.6±16.0	105.5±13.1	0.78
Systolic blood pressure (mmHg)	131.2±16.9	133.5±18.9	134.6±19.1	<0.001	138.1±17.1	138.6±18.2	139.5±17.7	0.61
Glycated haemoglobin (%)	5.4±0.5	5.5±0.5	5.5±0.6	<0.001	5.6±0.6	5.6±0.5	5.8±0.8	0.034
Glycated haemoglobin (mmol/mol)	35±5	36±5	37±6		38±8	38±6	40±9	
Total cholesterol (mmol/l)	6.17±1.21	6.02±1.31	5.79±1.19	<0.001	6.16±1.21	5.90±1.31	5.81±1.19	<0.001
HDL cholesterol (mmol/l)	1.62±0.33	1.58±0.33	1.55±0.32	<0.001	1.44±0.33	1.42±0.33	1.42±0.32	0.26
Triglycerides (mmol/l)	1.64±1.33	1.64±1.12	1.63±1.23	0.80	2.08±1.33	2.03±1.12	2.02±1.23	0.58
C-reactive protein (mg/l) <sup>b</sup>	1.3 (1.9)	1.6 (2.4)	1.9 (2.8)	<0.001	3.3 (3.7)	3.0 (4.2)	3.8 (5.4)	<0.001
Fibrinogen (g/l)	2.94±0.67	3.09±0.70	3.23±0.67	<0.001	3.24±0.67	3.28±0.70	3.39±0.67	<0.001

Data presented as mean± SD unless otherwise stated;

<sup>a</sup>In men, the range of handgrip strength was 4 – 35.3, 35.4 – 44.2, >44.2 kg for bottom, intermediate and top tertile. The corresponding ranges in women were 4 – 19.6, 19.7 – 24.9, >24.9 kg , respectively.

<sup>b</sup>median (interquartile range).

**Table 3** Associations between handgrip strength and risk of incident type 2 diabetes among obese and non-obese participants free of physician diagnosed diabetes at baseline (n=5,953).

<b>Sex-specific handgrip strength tertile</b>	<b>Cases/n</b>	<b>Model 1 HR (95% CI)</b>	<b>Model 2 HR (95% CI)</b>
<b>Non-obese participants</b>			
High	21/1391	1.00 (reference)	1.00 (reference)
Intermediate	36/1502	1.54 (0.90, 2.63)	1.49 (0.86, 2.53)
Low	35/1390	1.72 (0.98, 3.02)	1.51 (0.86, 2.66)
<b>Obese participants</b>			
High	33/603	3.47 (2.03, 5.96)	3.25 (1.89, 5.60)
Intermediate	49/571	5.68 (3.42, 9.45)	4.85 (2.90, 8.11)
Low	42/496	5.97 (3.49, 10.23)	4.93 (2.85, 8.53)

**Model 1:** adjusted for age and sex. **Model 2:** adjusted for age, sex, physical activity, smoking, alcohol, depressive symptoms, prevalent cardiovascular disease (angina, heart disease, heart failure, heart murmur, arrhythmia, stroke)

**Table 4** Associations between handgrip strength using a binary cut off point with weakness defined as handgrip < 26kg in men and < 16 kg in women and risk of incident type 2 diabetes among obese and non-obese participants free of physician diagnosed diabetes at baseline (n=5953).

<b>Sex-specific handgrip strength using binary cut *</b>	<b>Cases/n</b>	<b>Model 1 HR (95% CI)</b>	<b>Model 2 HR (95% CI)</b>
<b>Non-obese participants</b>			
Normal	83/3789	1.00 (reference)	1.00 (reference)
Weak	10/494	0.97 (0.49, 1.90)	0.86 (0.44, 1.68)
<b>Obese participants</b>			
Normal	108/1484	3.43 (2.57, 4.57)	3.13 (2.33, 4.18)
Weak	16/186	4.27 (2.47, 7.37)	3.57 (2.04, 6.24)

*\*Weakness defined as handgrip < 26kg in men and < 16 kg in women.*

**Model 1:** adjusted for age and sex.

**Model 2:** adjusted for age, sex, physical activity, smoking, alcohol, depressive symptoms, and prevalent cardiovascular disease (angina, heart disease, heart failure, heart murmur, arrhythmia, stroke)

**Table 5** Associations between handgrip strength and risk of incident type 2 diabetes among centrally obese and non-obese participants free of physician diagnosed diabetes at baseline (n=6134).

<b>Sex-specific handgrip strength using binary cut *</b>	<b>Cases/n</b>	<b>Model 1 HR (95% CI)</b>	<b>Model 2 HR (95% CI)</b>
<b>Non-obese participants</b>			
Normal	37/2656	1.00 (reference)	1.00 (reference)
Weak	7/388	1.51 (0.66, 3.43)	1.32 (0.58, 3.00)
<b>Obese participants†</b>			
Normal	158/2742	4.39 (3.07, 6.28)	4.09 (2.85, 5.87)
Weak	19/348	4.82 (2.72, 8.55)	3.99 (2.23, 7.13)

\*Weakness defined as handgrip < 26kg in men and < 16 kg in women.

†Central obesity defined as waist circumference >102cm in men and >88cm in women

**Model 1:** adjusted for age and sex.

**Model 2:** adjusted for age, sex, physical activity, smoking, alcohol, depressive symptoms, and prevalent cardiovascular disease (angina, heart disease, heart failure, heart murmur, arrhythmia, stroke)